

REMARKS

Please reconsider the application in view of the above amendments and the following remarks. Applicant thanks the Examiner for carefully considering this application.

Disposition of Claims

Claims 1-15 are pending in this application. Claim 1 is independent. The remaining claims depend, directly or indirectly, from claim 1.

Amendments to the claims

Claim 1 has been amended to correct typographic errors. No new matter has been added by these amendments.

Rejection(s) under 35 U.S.C § 112

Claims 1-15 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite.

Independent claim 1 has been amended in this reply to correct typographic errors. Specifically, the preamble has been amended to recite a “flexible printed circuit.” Accordingly, withdrawal of this rejection is respectfully requested.

Rejection(s) under 35 U.S.C § 103

Claims 1-15 were rejected under 35 U.S.C. § 103(a) as being obvious over Fraivillig

(U.S. Patent No. 6,015,607) (“the Fraivillig ‘607 patent”). This rejection is respectfully traversed.

The present invention relates to methods for manufacturing flexible printed circuits. A method in accordance with one embodiment of the invention, as recited in claim 1, includes the steps of: adhering a conductive layer to a first surface of a bond film using a first adhesive layer to produce a circuit substrate, wherein the adhering is achieved by *partially activating the first adhesive layer such that the conductive layer is tack-bonded to the bond film*; processing the circuit substrate to produce the flexible printed circuit; and laminating the heat sink to a second surface of the bond film of the flexible printed circuit using a second adhesive layer.

Thus, in accordance with embodiments of the invention, the first adhesive layer that bonds the conductive layer (metal foil) to the dielectric layer (bond film) is by partially activating the first adhesive layer to form a tack-bond in the first step. The second adhesive layer should be no more than partially cured (i.e., remain B-staged) at the relatively lower temperature used in the first lamination step so that it retains the ability to be fully cured in the second lamination step. (specification, p. 9, [0028]).

In contrast, the Fraivillig ‘607 patent discloses methods for making flexible laminates for use in flexible circuitry. The flexible laminate includes a flexible substrate layer bonded to a metal foil by an adhesive layer. The adhesive layer comprises a polyetherimide or a siloxane polyetherimide copolymer. (Abstract). The polyetherimide adhesive layer is *already fully reacted* (fully cured). (Col. 3, line 59). Therefore, the adhesive layer of the Fraivillig ‘607 patent cannot be *partially activated to form a tack*

bond, as required by claim 1. The adhesive action of polyetherimide is through polymer softening and flowing, rather than from activation and reaction by heat.

The Fraivillig '607 patent discloses methods using a *single-step* lamination to laminate a metal foil to a dielectric substrate or to laminate a flexible circuit to a heat sink. It does not disclose a two-step bonding process in which the first step forms a tack bond by partially reacting (activating) the adhesive.

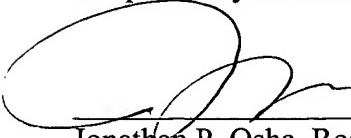
In view of the above, the Fravillig '607 patent fails to teach or suggest the present invention as recited in claim 1. Therefore, claim 1 is patentable over the Fraivillig '607 patent. Claims 2-15 depend, directly or indirectly, from claim 1 and, therefore, are patentable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

Conclusion

Applicant believes this reply is fully responsive to all outstanding issues and places this application in condition for allowance. If this belief is incorrect, or other issues arise, the Examiner is encouraged to contact the undersigned or his associates at the telephone number listed below. Please apply any charges not covered, or any credits, to Deposit Account 50-0591 (Reference Number 07009.011002).

Respectfully submitted,

Date: 12.29.2004


Jonathan P. Osha, Reg. No. 33,986
OSHA & MAY L.L.P.
One Houston Center, Suite 2800
1221 McKinney Street
Houston, TX 77010
Telephone: (713) 228-8600
Facsimile: (713) 228-8778

85193_1.DOC